Calculation Sheet

Job No: P5550/Joists **Joist:** Healey Consulting. J1.

Contract No: **Site:** Healey Consulting, Healey Consulting, 63 Dale Street, Milnrow

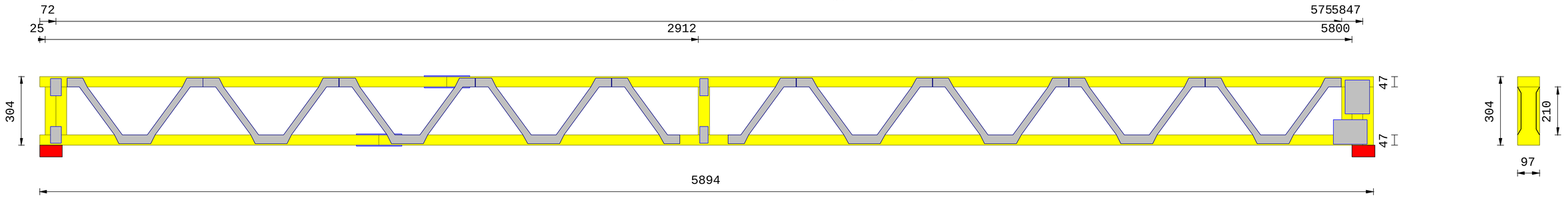
Design By: Mark Dunn, Sandersons FRT, Milnrow. Tel 01706 657827

easi-joist® EC5 Version 5.46

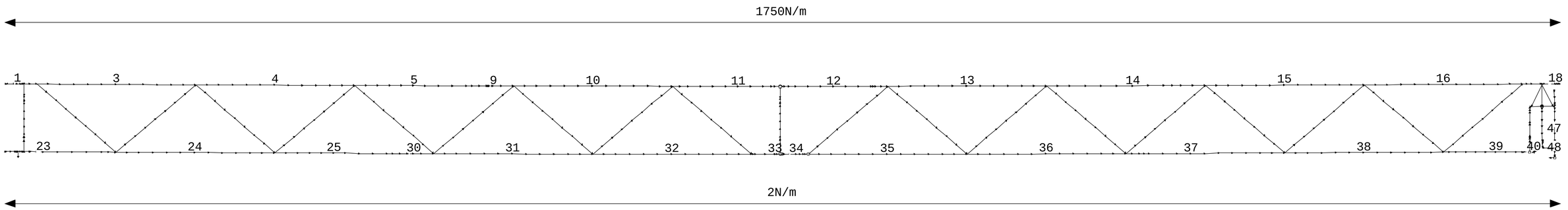
1 x 2 ply

DESIGNED FOR ROOF!

J1. 5894x304x97mm TR26, 40.5kg, 1x2ply, pitch=0.00°



J1. 5894x304x97mm TR26, 40.5kg, 1x2ply, pitch=0.00°



SPACING 200mm

Uniform Loads

Category	*Chord*	*Offset1(mm)*	*Offset2(mm)*	*Load*	*Units*	*Source*
Dead load	1=Top	0	5894	1750	N/m	Line
Dead load	1=Top	0	5894	1	N/m²	Special
Dead load	2=Bottom	0	5894	2	N/m²	Special
Snow uniform	1=Top	0	5894	2	N/m²	Special
Wind uplift	1=Top	0	5894	-716	N/m²	V.Wind

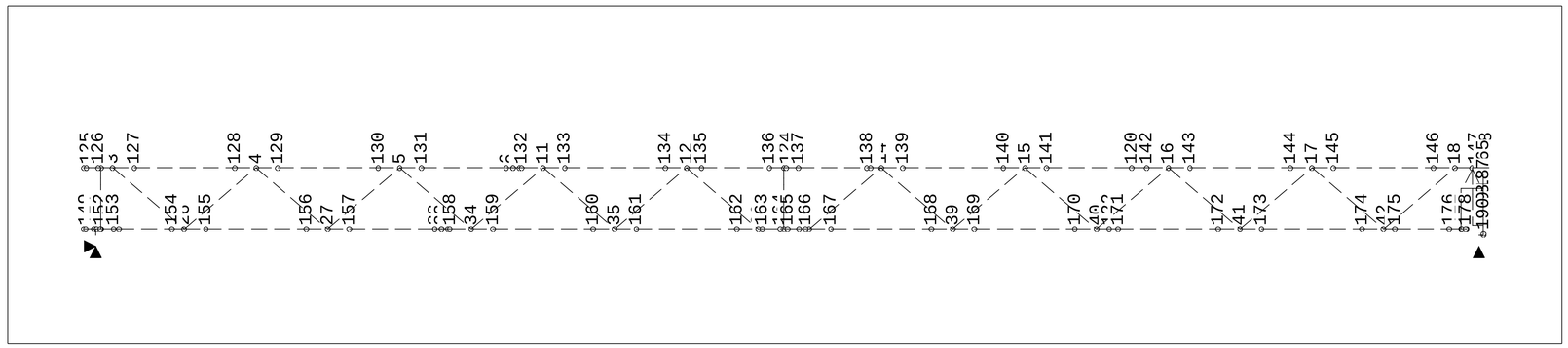
Point Loads

Category	*Chord*	*Offset(mm)*	*Load(N)*	*Source*
Man point load - TC	1=Top	2947	900	Man

REACTIONS

REACTIONS (N) - 2 Ply

Support		Vert.	Horiz.
14	Dead load	5151.9	0.0
18	Dead load	5162.6	0.0
14	Wind uplift	-418.0	0.0
18	Wind uplift	-418.9	0.0
14	Man point load - TC	449.5	0.0
18	Man point load - TC	450.5	0.0



BEARING STRESSES

2 PLY:Reactions shown for the n-ply truss

Lef = L + 30;

Sup.No.	Reaction [N]	LC	kmod	Width [mm]	Eff. Area [mm] * [mm]	kc90	Stress [%]	Min Width [mm]
14	6955	1	0.60	47	47 * 194	1.00	6.6	4
18	6969	1	0.60	100	130 * 194	1.50	14.0	10

REQUIRED SHOE CHARACTERISTIC CAPACITIES

Support No.	On Timber -- Down --| LC	On Timber -- Down --| [N]	On Timber - Uplift -| LC	On Timber - Uplift -| [N]	On Masonry -- Down --| LC	On Masonry -- Down --| [N]	On Masonry - Uplift -| LC	On Masonry - Uplift -| [N]	Worst Factored Reacts. -- Down --| LC	Worst Factored Reacts. -- Down --| [N]	Worst Factored Reacts. - Uplift -| LC	Worst Factored Reacts. - Uplift -| [N]
14	1	15069	0	0	4	10662	0	0	4	7108	0	0
18	1	15101	0	0	4	10684	0	0	4	7122	0	0

Calculation Results DESIGN OK

TIMBER STRENGTH PROPERTIES (N/mm2)

No	Reference	E_0,m	E_90,m	fm,k	ft,o,k	ft,90,k	fc,o,k	fc,90,k	fv,k	Type	Gmt	bc	Kc90	kcr
27	TR26	11000	370	28.3	17.6	0.4	22.9	2.6	4.0	ST	1.30	0.20	1.50	0.67

Designed according to EN 1995-1-1 & ETA-07/0032

Service Class: 1

Ksys: : 1.10

Partial Material Factors: Gamma M(timber): 1.30;Gamma M(steel): 1.15;

Top chord restrained at 400 mm (on slope).

LOAD COMBINATIONS

Product of Partial Factors gamma times combination factor psi0

Loadgroup	1	2	3	4	5	6	7

Dead load	1.35	1.25	1.00	1.25	1.00	1.25	1.00
Wind uplift	-	-	-	-	-	1.50	1.50
Man point load - TC	-	-	-	1.50	1.50	-	-
Kmod	0.60	0.60	0.60	0.90	0.90	1.10	1.10

MEMBER END FORCES (characteristic)

Member end forces LG: 1 Dead load

Mem	Mom(L) [Nm]	Mom(R) [Nm]	Ax. [N]	Sh(L) [N]	Sh(R) [N]	Mem	Mom(L) [Nm]	Mom(R) [Nm]	Ax. [N]	Sh(L) [N]	Sh(R) [N]
1	0	-2	0	0	-63	3	103	-45	-2940	17	-509
4	-45	-1	-7909	336	-191	5	-1	25	-11103	254	-137
9	16	-7	-11103	-186	-273	10	-7	-3	-13200	270	-257
11	-3	26	-14081	250	-106	12	26	-3	-14082	108	-249
13	-3	-7	-13267	256	-271	14	-7	-1	-11232	274	-253
15	-1	-47	-8068	187	-340	16	-47	112	-3273	528	3
18	-2	0	0	62	0	23	42	56	117	39	39
24	56	5	5928	-85	-85	25	5	17	9771	28	28
30	19	21	9771	28	28	31	21	23	12473	2	2
32	23	20	13939	-4	-4	33	20	33	14081	118	118
34	33	23	14082	-96	-96	35	23	23	13969	0	0
36	23	20	12565	-4	-4	37	20	12	9902	-14	-14
38	12	29	6171	28	28	39	29	-17	573	-140	-140
40	0	0	0	0	0	42	10	-10	-2542	-117	-117
43	0	0	-214	0	0	44	8	81	140	574	574
47	-24	-46	-2340	-144	-144	48	-53	-53	-2576	0	0
51	-18	5	-235	144	144	52	0	0	3717	0	0
53	0	0	-3923	0	0	54	0	0	2609	0	0
55	0	0	-2446	0	0	56	0	0	1753	0	0
57	0	0	-1799	0	0	58	0	0	957	0	0
59	0	0	-970	0	0	60	0	0	187	0	0
61	0	0	148	0	0	62	0	0	-924	0	0
63	0	0	922	0	0	64	0	0	-1755	0	0
65	0	0	1746	0	0	66	0	0	-2415	0	0
67	0	0	2490	0	0	68	0	0	-3815	0	0
69	0	0	3555	0	0						

Member end forces LG: 2 Wind uplift

Mem	Mom(L) [Nm]	Mom(R) [Nm]	Ax. [N]	Sh(L) [N]	Sh(R) [N]	Mem	Mom(L) [Nm]	Mom(R) [Nm]	Ax. [N]	Sh(L) [N]	Sh(R) [N]
1	0	0	0	0	5	3	-8	4	238	-1	41
4	4	0	642	-27	15	5	0	-2	901	-21	11
9	-1	1	901	15	22	10	1	0	1071	-22	21
11	0	-2	1142	-20	9	12	-2	0	1142	-9	20
13	0	1	1076	-21	22	14	1	0	911	-22	21
15	0	4	654	-15	28	16	4	-9	265	-43	0
18	0	0	0	-5	0	23	-3	-5	-9	-3	-3
24	-5	0	-481	7	7	25	0	-1	-793	-2	-2
30	-2	-2	-793	-2	-2	31	-2	-2	-1012	0	0

32	-2	-2	-1131	0	0	33	-2	-3	-1142	-10	-10
34	-3	-2	-1142	8	8	35	-2	-2	-1133	0	0
36	-2	-2	-1019	0	0	37	-2	-1	-803	1	1
38	-1	-2	-500	-2	-2	39	-2	1	-46	11	11
40	0	0	0	0	0	42	-1	1	206	9	9
43	0	0	17	0	0	44	-1	-7	-11	-47	-47
47	2	4	190	12	12	48	4	4	209	0	0
51	1	0	19	-12	-12	52	0	0	-301	0	0
53	0	0	318	0	0	54	0	0	-211	0	0
55	0	0	198	0	0	56	0	0	-142	0	0
57	0	0	146	0	0	58	0	0	-77	0	0
59	0	0	78	0	0	60	0	0	-15	0	0
61	0	0	-12	0	0	62	0	0	75	0	0
63	0	0	-75	0	0	64	0	0	142	0	0
65	0	0	-141	0	0	66	0	0	196	0	0
67	0	0	-202	0	0	68	0	0	309	0	0
69	0	0	-288	0	0						

Member end forces LG: 3 Man point load - TC

Mem	Mom(L) [Nm]	Mom(R) [Nm]	Ax. [N]	Sh(L) [N]	Sh(R) [N]	Mem	Mom(L) [Nm]	Mom(R) [Nm]	Ax. [N]	Sh(L) [N]	Sh(R) [N]
1	0	0	0	0	0	3	10	-1	-291	-18	-18
4	-1	2	-850	5	5	5	2	4	-1361	4	4
9	4	4	-1361	4	4	10	4	-6	-1898	-17	-17
11	-6	23	-2367	71	71	12	23	-6	-2367	366	-84
13	-6	4	-1920	18	18	14	4	2	-1382	-5	-5
15	2	-2	-871	-6	-6	16	-2	11	-322	21	21
18	0	0	0	0	0	23	4	5	10	3	3
24	5	0	585	-7	-7	25	0	2	1106	2	2
30	2	2	1106	2	2	31	2	3	1618	2	2
32	3	2	2184	-2	-2	33	2	19	2367	155	155
34	19	4	2367	-141	-141	35	4	3	2202	-1	-1
36	3	2	1637	-2	-2	37	2	1	1125	-1	-1
38	1	2	611	2	2	39	2	-1	49	-11	-11
40	0	0	0	0	0	42	1	-1	-222	-10	-10
43	0	0	-296	0	0	44	1	7	11	49	49
47	-2	-4	-204	-13	-13	48	-5	-5	-225	0	0
51	-2	0	-20	13	13	52	0	0	370	0	0
53	0	0	-386	0	0	54	0	0	349	0	0
55	0	0	-336	0	0	56	0	0	335	0	0
57	0	0	-337	0	0	58	0	0	368	0	0
59	0	0	-376	0	0	60	0	0	240	0	0
61	0	0	216	0	0	62	0	0	-372	0	0
63	0	0	371	0	0	64	0	0	-335	0	0
65	0	0	337	0	0	66	0	0	-335	0	0
67	0	0	341	0	0	68	0	0	-380	0	0
69	0	0	359	0	0						

TIMBER STRESSES (Axial + Bending)

Timber No	Mem No	--Position-- x [mm]	y [mm]	Ax. [N]	Mom. [Nm]	Critical Check	eff.Length Y [mm]	Z [mm]	Kc	eff.Lz [mm]	kcrit	khm	kht	Stress Ref [%]	maximum [%]	LC
1001	5	1594	280	-14989	48	Compr Y	569	400	0.86	400	1.00	1.26	1.09	40.4	40.4	1
1002	13	3646	280	-17911	47	Compr Y	563	400	0.86	400	1.00	1.26	1.09	46.5	46.5	1
2001	25	1450	24	13192	22	Ten	---	---	---	2864	1.00	1.26	1.09	33.1	33.1	1
2002	34	2954	24	19011	42	Ten	---	---	---	2839	1.00	1.26	1.09	49.3	49.3	1
30	42	72	84	-3432	11	Other	---	---	---	167	1.00	1.10	1.09	3.2	3.2	1
40	43	2936	210	-712	0	Other	---	---	---	167	1.00	1.26	1.09	0.9	0.9	4
50	44	5776	139	190	66	Ten	---	---	---	127	1.00	1.26	1.09	10.7	10.7	1
214	48	5870	6	-3478	-71	Other	---	---	---	43	1.00	1.26	1.09	11.4	11.4	1
215	51	5824	139	-318	-13	Other	---	---	---	157	1.00	1.26	1.09	2.1	2.1	1

METAL-WEB STRESSES

Mem	Stress	Ax.[N]	LC	Capacity
52	78.1%	5019	1	13920
53	71.4%	-5296	1	16070
54	80.2%	3522	1	9510
55	44.5%	-3302	1	16070
56	53.9%	2367	1	9510
57	32.7%	-2429	1	16070
58	29.4%	1292	1	9510
59	17.7%	-1310	1	16070
60	9.0%	595	4	9510
61	7.7%	510	4	9510
62	16.8%	-1248	1	16070
63	28.4%	1244	1	9510
64	31.9%	-2369	1	16070
65	53.7%	2358	1	9510
66	44.0%	-3261	1	16070
67	76.6%	3362	1	9510
68	69.4%	-5151	1	16070
69	74.7%	4800	1	13920

DEFLECTIONS: Wfin

(l/250, l = 5800)

Tim. item	Mem No.	- Position x	y	- Worst case [mm]	[%]	LC	P+L+M [mm] LC 1	P+L+M+snow [mm] LC 0
1001	5	1772	280	-13.0	56.2	1	-13.0	
1002	11	2936	280	-15.7	67.8	1	-15.7	
2001	25	1472	24	-11.5	49.4	1	-11.5	
2002	33	2936	24	-15.6	67.4	1	-15.6	
30	42	72	236	-0.7	3.0	1	-0.7	
40	43	2936	236	-15.7	67.6	1	-15.7	
50	44	5776	68	-0.9	4.1	1	-0.9	
214	48	5870	0	0.2	0.8	1	0.2	
215	51	5824	195	-0.4	1.9	1	-0.4	

Nodes and Members

Members

Member	Node End1	Node End2
1	1	2
2	2	3
3	3	4
4	4	5
5	5	6
6	6	7
7	7	8
8	8	9
9	9	10
10	10	11
11	11	12
12	12	13
13	13	14
14	14	15
15	16	17
16	17	18
17	18	19
18	19	20
19	20	21
20	21	22
21	22	23
22	23	24
23	24	25
24	25	26
25	26	27
26	27	28
27	28	29
28	29	30
29	30	31
30	18	2
31	3	19
32	19	4
33	4	20
34	20	5
35	5	21
36	21	6
37	6	22
38	22	7
39	7	23
40	24	8
41	25	9

Nodes

Node	X	Y
1	0	280
2	72	280
3	121	280
4	723	280
5	1325	280
6	1927	280
7	2529	280
8	2936	280
9	3345	280
10	3947	280
11	4549	280
12	5151	280
13	5751	280
14	5776	280
15	5894	280
16	0	23
17	50	23
18	72	23
19	421	23
20	1023	23
21	1625	23
22	2227	23
23	2829	23
24	2936	23
25	3043	23
26	3645	23
27	4247	23
28	4849	23
29	5451	23
30	5776	23
31	5800	23

Members

Member	Node End1	Node End2
42	9	26
43	26	10
44	10	27
45	27	11
46	11	28
47	28	12
48	12	29
49	29	13
50	30	14

Nodes

Node	X	Y

TIMBER SIZES & GRADES

TOP CHORD : 47TR26
BOT CHORD : 47TR26
COLUMNS : 47TR26

Joist Weight = 40.5Kg

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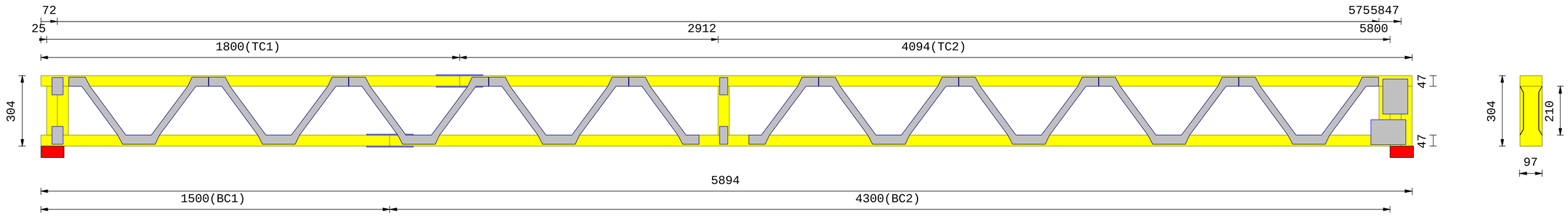

J1

NO.JOISTS: 1 NO.OF PLYS: 2 WIDTH: 97 SPACING: 200mm	LOADING: See calcs for others BC-DEAD:2N/m² TC-SNOW:2N/m²	JOIST REF: J1 DATE: 25-3-2021	PROJECT: Healey Consulting JOB NO: Joists SITE: Healey Consulting, 63 Dale Street Milnrow

1. Dimensions must be confirmed before fabrication.

SIGNATURE.....

DESIGN BY :- Mark Dunn Sandersons FRT, Milnrow. Tel 01706 657827